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NSIDC DAAC M&O Equipment

Technical Paper

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Abstract

This document supplies a basic overview of the maintenance and operations office environment provided at the NSIDC DAAC.

Keywords: NSIDC, M&O, Hardware, COTS, Software.

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1. Introduction

1.1 Purpose

The purpose of this document is to present an overview description of the maintenance and operations HW used by the NSIDC DAAC staff to monitor, analyze, report, and manage the operational HW and SW. This document has been written to describe the essential hardware components and is intended to document the HW and SW configurations.

1.2 Organization

The remainder of the document is organized as follows:

- Section 2: Related Documents
- Section 3: NSIDC DAAC M&O Equipment Requirements
- Section 4: NSIDC DAAC M&O Equipment
- Section 5: NSIDC DAAC M&O Equipment Test Results
- Abbreviations and Acronyms

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2. Related Documentation

2.1 Parent Documents

The parent documents are the documents from which this document's scope and content are derived.

423-41-01	National Snow and Ice Data Center, EOSDIS Core System (ECS) Statement of Work

2.2 Applicable Documents

Documents referenced in this document are listed below.

920-series General Documents

920-TDN-005	NSIDC Cable Management Plan

921-series General Documents

921-TDN-002	NSIDC Hardware Network Diagram

ECS CDRLs

601-CD-001	Maintenance and Operations Management Plan for the ECS Project
607-CD-001	Maintenance and Operations Position Descriptions for the ECS Project
608-CD-001	ECS Operations Plan for Release B

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3. NSIDC DAAC M&O Equipment Requirements

Section 4 describes the functions performed using the NSIDC DAAC M&O equipment. The following comprise the requirements for this equipment.

3.1 General

NSIDCMO0100 Number of staff. The NSIDC DAAC M&O Equipment shall provide, at a minimum, the tools for the following numbers of DAAC staff:

a. Management and Administration[1]: 2

b. Engineering[2]: 6

c. Operations[3]: 3

NSIDCMO0110 System administration. The capability to backup and restore files from each component shall be provided.

NSIDCMO0120 Status and performance reports. The NSIDC DAAC M&O Equipment shall provide the tools to review and analyze system status and performance reports.

NSIDCMO0130 Management and technical reports. The NSIDC DAAC M&O Equipment shall provide the tools to review and/or develop management and technical reports on ECS performance.

NSIDCMO0140 DAAC internal coordination. The NSIDC DAAC M&O Equipment shall provide the tools in support of coordination within the DAAC.

NSIDCMO0150 DAAC external coordination. The NSIDC DAAC M&O Equipment shall provide the tools in support of coordination with other organizations including, at a minimum, other DAACs, the SMC, and other ECS organizations.

NSIDCMO0160 ECS documentation. The NSIDC DAAC M&O Equipment shall provide the tools to access, create, and maintain ECS documentation.

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[1] Positions per DIDs 607 & 608: DAAC ECS Contract Manager, DAAC Manager

[2] Positions per DIDs 607 & 608: DAAC System Engineer, DAAC SW Maintenance Engineer, DAAC System Test Engineer, DAAC Database Administrator, DAAC CM Administrator, DAAC ILS/HW Maintenance Coordinator, DAAC Science SW I&T Support Engineer, DAAC Science Coordinator

[3] Positions per DIDs 607 & 608: DAAC System Administrator

3.2 Management and Administration

NSIDCMO0200 Management planning resources. The NSIDC DAAC M&O Equipment shall provide tools to support planning, budgeting, accounting, resource management, scheduling and other contract management activities.

NSIDCMO0210 Management policies and procedures. The NSIDC DAAC M&O Equipment shall provide the tools to develop and maintain ECS, DAAC and/or building policies and procedures.

NSIDCMO0220 Management documents. The NSIDC DAAC M&O Equipment shall provide tools for production and maintenance of memos, reports, and expense reports.

3.3 Engineering

NSIDCMO0300 Operations data. The NSIDC DAAC M&O Equipment shall provide the tools to allow for retrieval, storage, analysis, and distribution of operations data.

NSIDCMO0310 DAAC analysis software. The NSIDC DAAC M&O Equipment shall provide the tools to create and maintain DAAC-unique software.

3.4 Operations

NSIDCMO0400 Operations policies and procedures. The NSIDC DAAC M&O Equipment shall provide the tools to develop and administer policies, directives, and guidance to implement ECS and DAAC operations tasking, procedures, practices, and priorities.

4. NSIDC DAAC M&O Equipment

The HW and SW provided for M&O personnel to use for data collection, reduction, analysis, reporting and internal and external coordination and communications (as distinct from performance of the ECS mission using the operational resources, e.g., Data Server Subsystem, Communications Subsystem, Systems Management Subsystem, etc.). These HW and SW resources allow the engineering personnel to perform the duties described in DID 601, ***Maintenance and Operations Management Plan***, and DID 607***, ECS Maintenance and Operations Position Descriptions***. The approximate number of personnel at the DAAC is shown in DID 608, ***ECS Operations Plan for Release B***.

Table 4-1 partitions these resources into three functional areas.

Table 4-1. NSIDC M&O Equipment Component Descriptions

Functional Area	Class/Type	Specifics
Management and Administration	PC	Personal computers
Engineering	X-Term	NCD HMX X-Terminals
	Printer	HP printers*
	PC	Personal computers
	Workstations	Sun workstations
	Servers	Sun servers*
	Storage	Sun disk arrays*
	Tape Drives	DLT's

4.1 NSIDC DAAC Functions

4.1.1 Management and Administration

The Management and Administration (MA) elements allow the management and supervisory staff at the DAAC to effectively communicate with other members of the DAAC staff as well as with external parties. Primary tasks performed on these resources include:

- ECS performance analysis - review and analyze system status and performance reports;
- ECS performance reporting - review and/or development of management and technical reports on ECS performance;
- DAAC Manager liaison- provide a point of contact to the DAAC Manager and staff on all ECS On-Site M&O organization activities;

* Also supports Management and Administration

- ECS M&O Office liaison - provide management liaison to ECS M&O Office staff including ECS staff at other DAACs, the SMC, the EOC, the SEO, the parent ECS M&O organization, and development and support organizations;
- ECS personnel supervision - manage ECS training, certification;
- ECS planning, budgeting, accounting, resource management, scheduling and subcontract management - provide financial management and reporting on the ECS On-Site M&O organization;
- ECS policies and priorities - ensure that ECS On-Site personnel are tasked in accordance with ECS policies and priorities as driven by DAAC needs; ensure that company, ECS, DAAC and/or building, procedures and policies;
- Administrative support - support planning, budgeting, accounting, resource management, scheduling and contract management activities;
- Secretarial support - provide typing, filing, expense reports, mail distribution, meeting scheduling, etc.

4.1.2 Engineering

The engineering staff at the DAAC provides the primary set of skills to monitor current performance, monitor and develop short and long-term trending data, analyses and reports, and develop configuration changes/tunings. These tasks are required so that the operational resources provide reliable, high performance support to the DAAC's customers.

The primary tasks are performed in whole or in part by this staff are:

- ECS algorithm development support - provide support to scientists in the development of algorithms that are executed by the ECS system;
- ECS algorithm I&T support - provide support to scientists in the test and integration of updated and new algorithms that are executed by the ECS system;
- ECS configuration management - coordinate usage of approved configuration management (CM) procedures; ensure that changes to the hardware, software, and procedures are properly documented and coordinated; if requested by Customer, provide recording secretarial tasks for the Customer Configuration Change Board (CCB); generate CCB monthly reports; prepare agendas for CCB meetings;
- ECS database administration - maintain the data bases and structure of the integrated system at the DAAC; provide the operations interface to perform data base administration utilities such as data base backup and recovery, performance monitoring, and tuning; administer user access control and daily data base synchronization;
- ECS development organization liaison - provide feedback on the performance of installed systems; coordinate future installations; support development activities such as design and document reviews; coordinate trouble tickets (TTs) and Configuration Change Requests (CCRs);

- ECS hardware maintenance - support the ECS availability requirements by replacement of LRUs; act as coordination point with the various vendors at the DAAC including preventative maintenance support; support the isolation of equipment problems; report on maintenance activities to the ECS ILS function;
- ECS integrated logistics support - interface with ECS ILS function in coordination of delivery of COTS hardware or software; handle ECS center shipping and receiving; act as local ILS representative;
- ECS performance analysis - analyze soft and hard copy reports on system effectiveness, productivity, capacity, and performance for ECS hardware and software resources and processes; monitor performance for trends and prepare reports on analyses;
- ECS planned upgrades - support and participate in planning and implementation of upgrades to the ECS;
- ECS property management - provide control of Government property; provide continuous audit trail from receipt of ECS procured or developed items until transfer of accountability;
- ECS quality assurance - perform Quality Assurance (QA) audits on a periodic basis to ensure adherence to established standards and procedures for hardware, software and operations; produce audit;
- ECS resource control - maintain and modify hardware and software system configurations, perform COTS administration (including operating system administration); support property management; support system anomaly tracking and analysis;
- ECS software maintenance - produce, deliver, and document corrections, modifications, and enhancements made to ECS software (including COTS), and/or adapt or incorporate COTS software for ECS use;
- ECS sustaining engineering - analyze and identify ways to accommodate needed improvements, new technologies and new concepts; manage system upgrades and evolution; control and maintain ECS updates; perform the activities necessary to assure ECS reliability, maintainability, and availability; support/provide evaluation of user inputs and monitor system performance to tune the system for optimum response and support; support operational readiness and performance assurance;
- ECS test and integration - feature test (i.e., ensure a new requirement and/or design is properly implemented) and regression test (i.e., ensure that previously provided capabilities continue to be properly provided) all system upgrades in DAAC environment; maintain and update test procedures and data bases; provide test statistics, analyses and reports.

4.1.3 Operations

The operations staff at the DAAC primarily performs its tasks using the deployed operational components. The following tasks, however, are performed in whole or in part using management and/or engineering components M&O resources.

- ECS operations personnel supervision - provide first line supervision of ECS operations, conflict resolution, policy enforcement, time keeping, productivity monitoring, shift worker scheduling, hiring, termination, promotions, performance appraisals, salary adjustments, discipline, etc., and
- ECS operations policy - develop and administer policies, directives, and guidance to implement ECS and DAAC operations tasking, procedures, practices, and priorities.
- ECS operations readiness - ensure elements are in a state of operational readiness at all times including launch preparations; conduct Operational Readiness Reviews and monitor M&O activities, provide visibility to DAAC, ESDIS and ECS management on operations readiness;
- ECS operations training and certification - develop and maintain center specific initial and refresher operations training and certification packages; maintain training and certification records; report on staff training; coordinate with SEO system-level training and certification requirements;
- ECS performance assurance - provide coverage of operational phase activities in PAIP (DID 501); continue the tasks of the RMA program throughout the operational phase;
- ECS production scheduling - schedule system updates and maintenance schedules; coordinate user requests.
- ECS operations coordination - exchange operations information between and among DAAC operators and with personnel at other locations.

4.2 Design Components

The components that comprise the NSIDC M&O equipment are shown in Figures 4.2-1 through 4.2-3. Additional DAAC supplied equipment is listed in Appendix A.

Tables 4.2-1 and 4.2-2 show the HW/SW mappings for the PCs, Sun and SGI equipment. Network information is shown in Table 4.2-3.

Figure 4.2-4 shows the M&O LAN network topology.

Network cabling is shown in ***NSIDC Cable Management Plan***, 920-TDN-005.

The location of the M&O equipment in the facility is under the control of the DAAC and is documented in the property management database administered by the DAAC.

Disk configurations for the M&O equipment are under the control of the DAAC system administrator.

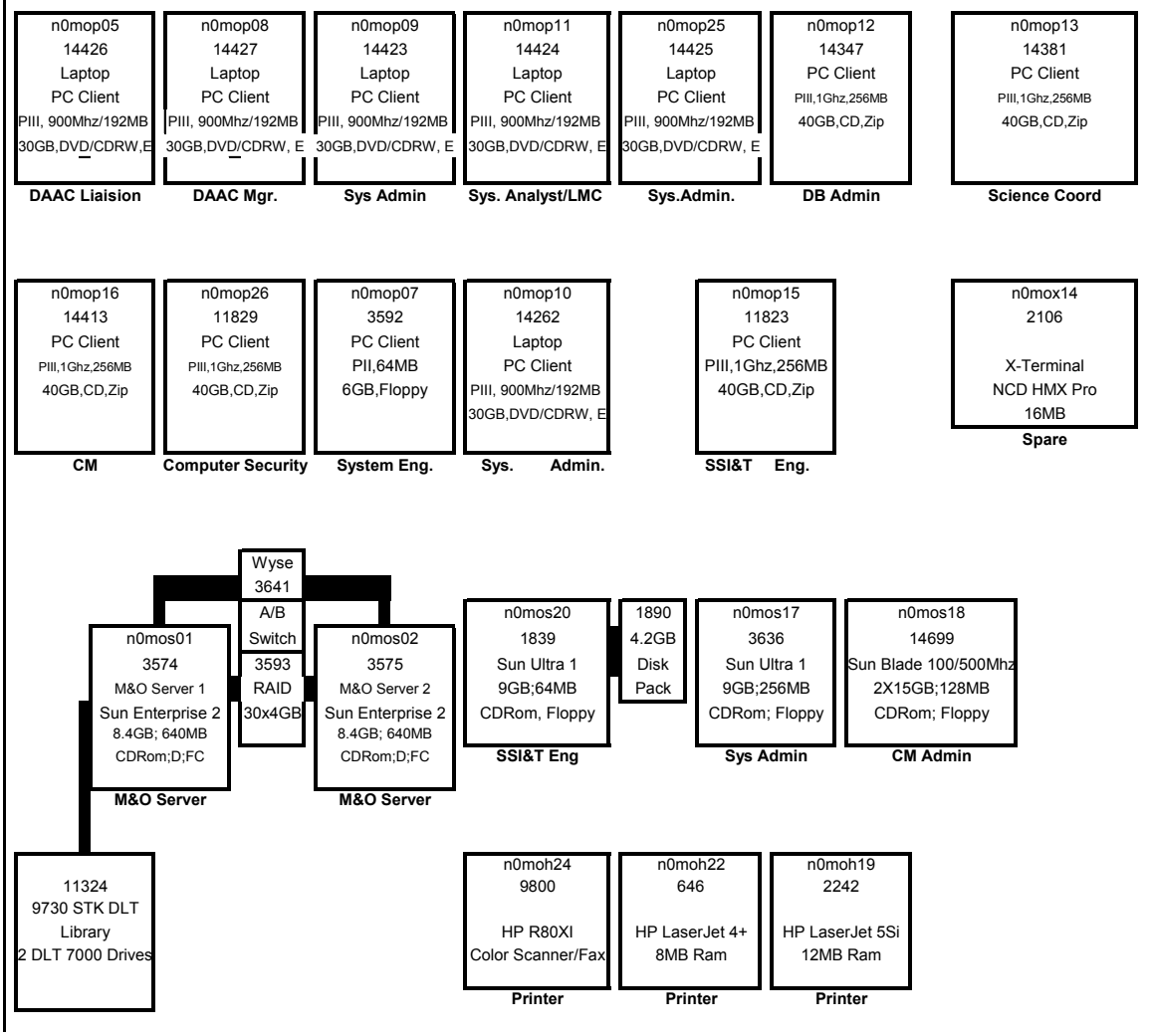


Figure 4.2-1. NSIDC ECS M&O Engineering HW

Table 4.2-1. NSIDC ECS M&O HW/SW Mapping

Host Name	Windows 2000 Pro	Windows 95	Linux Suse Pro 7.2	Microsoft Office 2000 Pro	Microsoft Project 98	Humngbrd Exceed 7.0	Norton Utilities 2002	Legato Netware 6.1.1 Client	Ssh2 4.0	Visio 2002	Eudora 5.0	VMWare 2.0 Wrkstn.	Norton AV 2001
n0mop05	X			X	X	X	X	X	X		X		X
n0mop07	X	X		X	X	X	X	X	X		X		X
n0mop08	X			X		X	X	X	X		X		X
n0mop09	X		X	X		X	X	X	X		X	X	X
n0mop10	X			X		X	X	X	X	X	X		X
n0mop11	X			X		X	X	X	X		X		X
n0mop12	X			X		X	X	X	X		X		X
n0mop13	X			X		X	X	X	X		X		X
n0mop15	X			X		X	X	X	X		X		X
n0mop16	X		X	X		X	X	X	X		X	X	X
n0mop25	X		X	X		X	X	X	X		X	X	X
N0mop26	X		X	X		X	X	X	X		X	X	X

Table 4.2-2. NSIDC UNIX Workstations HW/SW Map

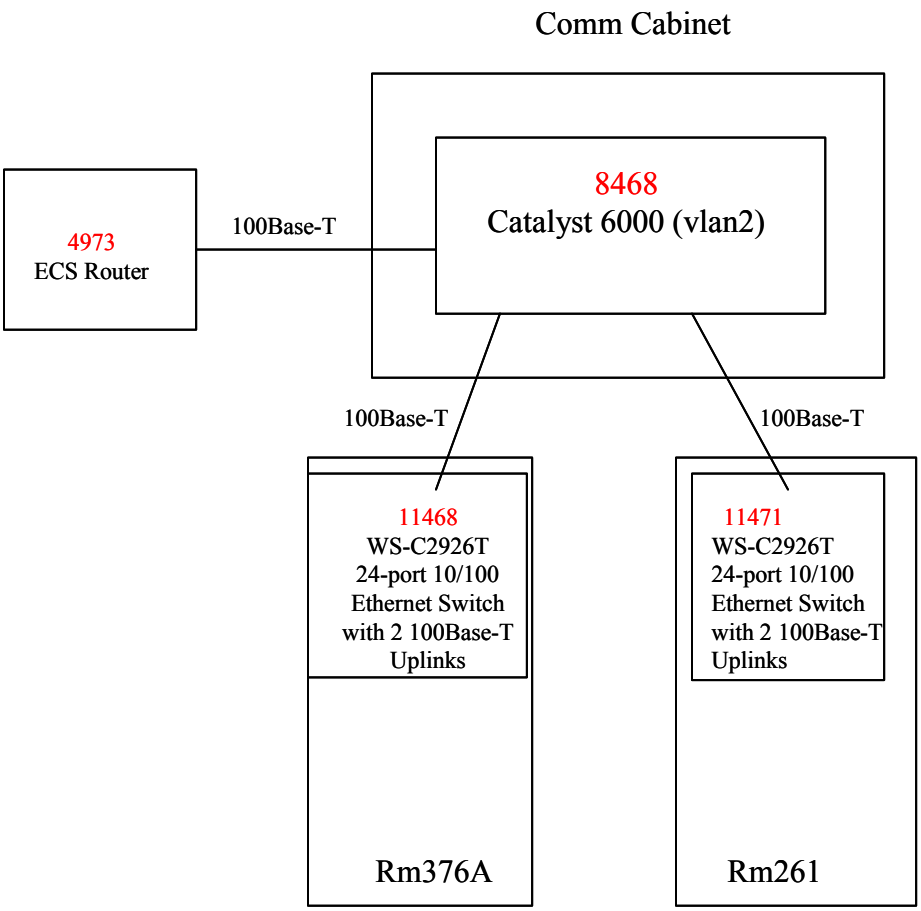
Host Name	Solaris 2.8	Legato Networker* 6.1.1	Sparc C Compiler	Sparc Compiler C++	Other (See Notes)	Ssh 2.0.13	Wrappers 7.6
n0mos01	2.8	server	X	X	X	X	X
n0mos02	2.8	client			X	X	X
n0mos17	2.8	client				X	X
n0mos18	2.8	client				X	X
n0mos20	2.8	client				X	X

Note: n0mos01 has netscape server browser, gcc, acrobat reader, jetadmin, volume manager, ssh installed. n0mos02 is the backup server for n0mos01.

Legato Networker consists of the following: Turbo/10 (server & 10 unix clients), JSM-32 (auto changer), two five pack PC clients.

Compilers on n0mos01: WS Compiler C Sparc 4.2, WS Compiler C++ Sparc 4.2, Workshop IPE Sparc 4.0, Workshop TeamWare Sparc 2.0, Workshop MPTools Sparc 3.1, Workshop Visual Sparc 2.0.

NSIDC M&O Network Infrastructure



Note: All cables are Cat 5 straight-through Ethernet cables.

Figure 4.2-2. NSIDC M&O LAN Topology

5. NSIDC DAAC M&O Equipment Test Results

5.1 NSIDC DAAC Requirements Traceability

Table 5-1 shows the mapping of Section 3 requirements to NSIDC M&O hardware and software elements described in section 4.

Table 5-1. NSIDC DAAC M&O Requirements Mapping (1 of 2)

Requirement	Description	SW Component(s)
NSIDCMO0100	Number of staff	PCs: Windows 2000 Workstations/Servers: Sun Solaris
NSIDCMO0110	System administration	PCs: Norton Utilities Workstations/Servers: Legato Networker
NSIDCMO0120	Management status and performance reports	PCs: Microsoft Office 2000 Professional
NSIDCMO0130	Management and technical reports	PCs: Microsoft Office 2000 Professional
NSIDCMO0140	DAAC internal coordination	PCs: Microsoft Office 2000 Professional
NSIDCMO0150	DAAC external coordination	PCs: Microsoft Office 2000 Professional
NSIDCMO0160	ECS documentation	PCs: Microsoft Office 2000 Professional Workstations/Servers: Acrobat

Table 5-1. NSIDC DAAC M&O Requirements Mapping (2 of 2)

Requirement	Description	SW Component(s)
NSIDCMO0200	Management planning resources	PCs: Microsoft Office 2000 Professional Microsoft Project
NSIDCMO0210	Management policies and procedures	PCs: Microsoft Office 2000 Professional
NSIDCMO0300	Operations data	PCs: Microsoft Office 2000 Professional Hummingbird Exceed
NSIDCMO0310	DAAC unique software	Workstations/Servers: None.
NSIDCMO0400	Operations policies and procedures	PCs: Microsoft Office 2000 Professional

5.2 Test Results

Installation of the NSIDC DAAC M&O hardware occurred in 1998. When the hardware and software was installed, each computer was initialized and the functionality of all HW, SW, and networks verified.

Abbreviations and Acronyms

CCB	Configuration Control Board
CCR	Configuration Change Request
CM	Configuration management
COTS	Commercial Off-the-Shelf
DAAC	Distributed Active Archive Center
ECS	EOSDIS Core System
NSIDC	National Snow and Ice Data Center, Boulder, Colorado
HW	Hardware
ILS	Integrated Logistics Support
LRU	Line Replaceable Unit
M&O	Maintenance and Operations
QA	Quality assurance
RMA	Reliability, Maintainability, Availability
SMC	System Monitoring Center
SW	Software
TT	Trouble tickets

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